

4. Communication dated August 15 :

Name of Comet.	Place of Observation and Observers.	Day.	Mean Solar Time at Place of Observation.	Observed Right Ascension of Comet.	Observed Declination of Comet.	No. of Obs.
144 De Vico (First).	Breslau : M. Boguslawski	1844. Sept. 15	h m s 11 0 0	h m s 0 44 10.55	— 12 57 31.1	8
		17	„	0 48 33.63	11 58 34.6	7
		18	„	0 50 37.40	11 29 27.8	11
		Oct. 4	9 0 0	1 13 30.25	4 22 46.5	8
		5	„	1 14 25.90	3 58 55.6	12
		8	„	1 16 56.29	2 50 40.1	12
	M. Schubert	„	„	1 16 55.84	2 50 33.8	11
	M. Boguslawski	14	„	1 21 2.88	— 0 44 58.8	9
		17	„	1 22 47.25	+ 0 13 12.1	4
		18	„	1 23 19.67	0 31 36.1	8
		„	„	1 23 19.94	0 31 38.0	6
		Nov. 9	„	1 34 53.63	6 5 46.1	7
		10	„	1 35 29.92	6 18 1.6	4
Colla.	Vienna	1845. June 25	10 8 7.7	127 57 56.1	+ 29 40 46.8	...

The Breslau observations are freed from aberration and parallax ; the Vienna observation is freed from refraction.

5. Communication, dated September 23, addressed to Mr. Hind :

“ M. d'Arrest of Berlin has sent me a very careful discussion of the last comet. After having compared the later observations with his second set of Elements, (*Astron. Nachr.* p. 232), of which I extract but your own observations,

	$\cos \delta d\alpha$	$d\delta$
June 9	— 0.8	— 4.1
11	+ 2.9	— 5.5
12	...	— 4.2

(The observed right ascension on June 12 appears 15.5 too small)

he formed out of 52 observed right ascensions and 54 observed declinations, 7 normal positions, all for mean Berlin midnight. They give the annexed errors compared with Elements II. The positions are referred to the apparent equinox of the day.

	R. A. of Comet.	Decl. of Comet.	$\cos \delta d\alpha$	$d\delta$	Number of Observations.
June 7.5	73 59 4.17	+ 44 50 26.09	— 0.90	+ 0.71	5 5
9.5	84 45 33.07	45 28 23.07	+ 0.10	— 2.77	5 6
10.5	89 54 28.79	44 15 36.07	+ 0.78	— 1.27	12 10
11.5	94 44 37.10	44 44 57.41	+ 3.20	— 2.01	9 9
12.5	99 11 56.83	43 59 52.04	+ 1.99	+ 0.06	7 11
14.5	106 52 11.58	41 59 40.01	+ 1.95	— 1.01	9 9
17.5	115 30 49.81	+ 38 25 30.75	+ 1.32	— 0.85	5 4

After having calculated the fourteen differential equations which these positions afford, and treated them according to their weight by the method of least squares, he found to represent them the following most probable parabola, with its probable limits :—

Elements, No. 3.

T June 5.720222 ± 0.000304 , M.T. Berlin.

π 262° 0' 32".8 $\pm 5''.1$ } M. Eq. 1845, Jan. 0.
 Ω 337 48 49.2 ± 37.9 }
i 131 4 51.6 ± 1.7

Log. *q* 9.6032278 ± 0.0000057 .

The remaining errors are

	$\cos \delta d\alpha$	$d\delta$
June 7	—0.01	+1.83
9	—0.87	—1.93
10	—0.27	—0.41
11	+1.36	—1.08
12	—0.11	+0.91
14	—0.19	+0.01
17	—0.03	—0.29

If you will express the elements as functions of an arbitrary eccentricity, you must add to the constants

$$\begin{aligned} dT &= +0.94592 \text{ de.} \\ d\pi &= -0.00141 \text{ de.} \\ d\Omega &= -0.00007 \text{ de.} \\ di &= +0.00780 \text{ de.} \\ d \log_e q &= -0.05891 \text{ de.} \end{aligned} \quad \begin{array}{l} \text{de being units of the 7th} \\ \text{decimal.} \end{array}$$

After seeing that you had, by your calculations, made the identity of the last comet with that of 1596 in the highest degree probable, he has calculated under this supposition the following ellipsis, which represents the observations best :—

Elements, No. 4.

T June 5.71064, M.T. Berlin.

π 262° 2' 55".9 } Eq. as before.
 Ω 337 48 56.1 }
i 131 18 1.3
 ϕ 81 50 22.3

Log. *a* 1.598394.

The probable error of a normal position = $\pm 1''.5$.

The remaining errors are

	$\cos. \delta d\alpha$	$d\delta$
June 7	+0.7	+0.4
9	—1.9	—2.7
10	—1.0*	—0.7
11	+1.9	—1.3
12	+1.0	+1.0
14	+2.0	—0.6
17	—3.7	+0.2

If you treat the normal positions, without making any supposition about the nature of the conic section, you find a hyperbola with an eccentricity $= 1.0025942 \pm 0.0008861$; but since after your calculations, there can be little doubt that the orbit is an ellipsis, M. d'Arrest has, of course, preferred to adapt an ellipsis to the observations."

6. Communication dated September 26 :

Observations of Comets made by M. Petersen at Altona.

Name of Comet.	Day.	Mean Solar Time at Place of Observation.	Observed Right Ascension of Comet.	Observed Declination of Comet.	No. of Obs.
Mauvais (Second).	1844. July 15	^h ^m ^s 11 48 52.6	[°] ['] ["] 235 43 50.9	[°] ['] ["] "	4
		12 9 25.6	.....	+ 42 4 30	2
	16	12 2 16.3	.....	41 25 52.6	3
		4 5.0	234 22 39.0	.....	2
		6 52.3	234 22 27.0	.....	3
	17	11 30 24.8	.....	40 47 4.0	8
		44 46.9	235 5 43.1	.....	11
	22	11 14 51.7	.....	37 13 57.9	5
		34 7.2	227 9 44.3	.....	10
	24	11 49 55.7	225 1 58.5	.....	7
		55 20.8	.....	35 41 59.0	6
		55 57.0	225 1 45.2	.....	10
De Vico (First).	Sept. 8	12 14 44.3	6 33 58.3	- 16 21 53.1	3
	21	11 4 50.7	....	10 2 39.9	5
		13 4.1	14 5 21.6	.....	9
	Oct. 6	12 35 16.7	18 51 46.5	- 3 32 37.7	1
	21	11 31.5	20 59 5.6	+ 0 52 0.7	10
d'Arrest.	1845. Jan. 3	8 57 34.6	292 33 6.2	.....	3
	10	7 39 4.2	.....	+ 41 30 14.6	8
		40 1.8	.....	41 30 0.4	4
		42 51.8	290 5 19.0	.....	13
		48 53.8	290 5 14.1	.....	8
	11	9 16 6.9	289 37 40.6	41 58 38.4	4
De Vico (Second).	April 1	8 33 13.3	123 58 41.3	+ 6 26 19.3	8
	2	8 33 18.3	123 19 44.7	4 49 16.4	8
	3	8 39 32.0	122 43 11.7	3 14 37.9	12
	5	8 23 13.4	.....	0 15 38.8	8
		33 42.5	121 36 42.5	.....	10
		9 8 24.1	121 35 56.0	0 12 46.3	4